Inefficiencies in Dynamic Contracting in the Mutual Fund Industry *

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Abstract

This paper analyzes a previously ignored agency relationship in the asset management industry, namely the relationship between mutual funds and the investment advisory firms that manage the assets of these funds. I construct a new data set that tracks the contractual agreements between U.S. mutual funds and their advisors between 1993-2002. This data set allows me to find cross-sectional and time-series determinants of advisory contracts, as well as study the impact of contract renegotiation on subsequent fund performance and net inflows. I first document that contract renegotiation and advisor changes are very rare events - only 10% of the funds undergo such a change. I also find that advisory contracts take into account differences in portfolio risk, ease of monitoring, economies of scale, restrictions on investors' actions as well as differences between the bargaining power of the funds and of their advisors. The sensitivity of the fee to past performance is not the same for all funds: for bottom and mid-performers it is negative and significant, and for top performers it is positive and significant. Separations between funds and advisors are more frequent for bottom funds compared to the rest, and for funds operating in higher uncertainly environments. I find that decreases in advisory rate have a positive and significant impact on subsequent performance, as well as on net inflows. Separating from an adviser has a significant and positive effect on the subsequent ranking of middle performers, a negative effect on top performers and no effect at all on the bottom performing funds. These results are puzzling: mutual funds are not actively renegotiating advisory contracts, even though there are clear benefits to such changes.

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1 Motivation

The goal of this paper is to analyze the effectiveness of contractual arrangements in the asset management industry. I construct a new data set that tracks the contracts written between U.S. mutual funds and their investment advisors[1] between 1993-2002. This data set allows me to find cross-sectional and time-series determinants of contractual arrangements and renegotiations and their impact on the funds' performance and inflows. My results indicate possible inefficiencies in the way mutual funds employ and pay advisory firms.

Mutual funds provide avenues for investors to get exposure to diverse classes of assets. The amount of money under management has increased dramatically in the past several decades, culminating to $7 trillion in 2002. More than half of the U.S. households invest in mutual funds, either directly or through retirement plans. Thus, it is important to understand if the asset management industry is organized efficiently. Answering this question is difficult, though, because of the complexity of the industry, which can be seen as a multi-layered principal-agent setting.

In this setting, there are multiple decision layers, that is, principal-agent relationships and the associated payment schemes, that need to be analyzed, as follows:

(a) investors choose between mutual funds;

(b) funds choose the composition and the pay of the board of directors, who then have the fiduciary duty to negotiate with all of the parties dealing with the funds in the best interest of investors;

(c) boards of directors of mutual funds choose which advisory firms are in charge with managing the funds' assets and what the advisory fee structure is;

(d) advisory firms choose individual portfolio managers for each fund under their supervision as well as the compensation scheme for these managers;

(e) individual portfolio managers choose which securities to hold in the fund's portfolio.

This paper is the first to shed light on the decision layer (c) above, that is, on the dynamics of the contractual agreements between funds and their investment advisors, and on the associated costs that stem from this agency layer previously ignored in the literature. I also describe the status-quo for (b) and will show the link between (a), (b) and (c), for a better understanding of how the asset management industry functions.

Previous papers have mainly analyzed (a) and (e) above: for instance, Sirri and Tufano (1998) documented a convex relationship between fund in-

[1]The investment advisory firm is a legal entity separate from the mutual fund, to which the fund outsources the portfolio management services.

flows and past performance, and Chevalier and Ellison (1999) showed that individual fund managers adjust the level of riskiness of their portfolio to minimize the possibility of termination.

The U.S. Securities and Exchange Commission (SEC) has recently shown interest in the way fund directors choose advisors and set advisory fees. In February 2004, the SEC proposed changes to improve the disclosure provided by registered management investment companies about how their board of directors evaluate and approve, and recommend shareholder approval of, investment advisory contracts. These changes are specified in the SEC Proposed Rule "Disclosure Regarding Approval of Investment Advisory Contracts by Directors of Investment Companies"[2], which is currently being evaluated by the Commission. The SEC's interest in changing these disclosure rules is an indication that there could be inefficiencies in the way fund directors choose investment advisory firms and their payment, which is the main finding of this paper.

The way funds choose advisory firms to contract with and what the advisory fee depends on are issues that have not yet been analyzed in a dynamic context, possibly because the contracts data is not available in the most frequently used data sets such as CRSP/Compustat or Morningstar. Hence, one of the contributions of this paper is the creation of a comprehensive data set that follows the contracts written between all U.S. mutual funds and their advisors between 1993-2002, and also tracks the funds' performance as well as their cross-sectional characteristics.

The contracts I analyze have a simple form for the majority of funds: the advisory fee is just a percentage of the fund's NAV. The rate paid differs across categories of funds and reflects differences in the ability to monitor advisors and differences in the riskiness of the investment strategy of the fund. The rate also compensates for restrictions imposed on investors actions, as in the case of closed-end funds, and it reflects the impact of economies of scale.

I show that funds rarely change their advisors or renegotiate the advisory contracts. The likelihood that a fund will separating from one of its advisors is higher in environments with higher uncertainty (i.e. equity funds, foreign securities funds). It is also higher following higher turnover, and following lower performance. Separations also depend on the relative bargaining power of the fund and of its advisers: the larger the fund family, the more likely it is that the fund will switch advisors, and the larger the advisors' market share, the less likely it is that the advisor will leave the fund.

Looking at the impact of contractual changes on subsequent performance, I also find that a fee decrease has a significant and positive impact on the funds' performance and net inflows. Changing advisors for funds in

[2]release Nos. 33-8364, 34-49219; IC 26350; File No. S7-08-04.

the middle three quintiles of performance also has a significant and positive effect on subsequent ranking. Hence, it seems that renegotiating contracts and changing advisors could be beneficial to the funds' investors, yet they do not happen often. This suggests that there may be inefficiencies in the way the advisory contracts are determined. I argue that these empirical findings are evidence against the existence of a contracting equilibrium in the industry and that the agents that ultimately bear the cost of these contracting inefficiencies are the fund investors.

The rest of the paper is organized as follows: section 2 describes the regulation and organizational structure of mutual funds, as well as possible conflicts of interests that may arise due to this structure. Section 3 reviews the extant relevant literature. Section 4 describes the data collection and presents summary statistics. Section 5 presents and discusses the results, and section 6 concludes the paper.

2 About funds, investment advisory firms and their contracts

The Investment Advisers Act of 1940 regulates the organizational structure of mutual funds. The Act stipulates that funds and their investment advisors must be separate entities. As Tufano and Sevick (1997) state it, "mutual funds are legal entities with no employees", as the they outsource all portfolio-related and administrative services. A fund's investors are represented by the fund's a board of directors, who have to choose the advisors that will manage the fund's money, as well as the compensation scheme to be employed. The Investment Advisors Act imposes restrictions on the contracts that mutual funds enter into with their advisers: the terms of the agreement cannot not exceed two years, a majority of outside directors must approve all renewals, and the contract may be terminated without penalty by the fund at any time with 60 days' notice.

A fund can have more than one investment adviser. It can have a primary advisor and two or three secondary ones. There is no rule as to how the tasks related to the fund's management is split between multiple advisers. In many instances, however, the primary advisor delegates all portfolio selection and trading responsibilities to secondary advisors but retains veto rights. In the vast majority of cases, the primary advisors of the fund are also the creators of the fund. They will select the directors that sit on the fund's board. By law, these directors have to act in the interests of the fund's investors only, but one can see that there is a clear conflict of interests here: directors are supposed to monitor (and reward accordingly) the firm that gave them that job to start with. Not surprisingly, and in spite of the legal provisions, anecdotal evidence suggests that boards do not perform their duties dilligently. This is summarized by Warren Buffett it in his letter

to Berkshire Hathaway shareholders in 2003: "A monkey will type out a Shakespeare play before an 'independent' mutual fund director will suggest that his fund look at other managers."

This suggests that in reality advisors control mutual fund boards, and, thus, there is a deep conflict of interests when it comes to contract renegotiation. This conflict of interests must bear significant economic costs on investors, given the sheer size of the asset management industry [3]. As I will show later, this cost comes in the form of investors paying excessive fees and funds retaining badly performing advisers.

3 Previous relevant work

There several strains of empirical[4] literature related to the subject of this paper. Deli (2002) looks at some of the cross-sectional differences in advisory contracts (using data for 1997 only). Deli and Varma (2002) and Almazan et al. (2003) analyze the portfolio restrictions faced by investment advisors and their impact on fund performance. There is a vast literature on mutual fund flows, persistence and performance. I review here the papers that are the most relevant - the ones that connect fund performance and flows to various contractual aspects.

Tufano and Sevick (1997) find several determinants of fees charged to investors by funds using a sample of open-end mutual funds offered by the largest 50 fund sponsors in 1992. Fees are inversely related to fund size, which may indicate economies of scale. Fund governance seems to matter in deciding the fees charged to investors: directors compensation has a positive association with fee levels in three out of the four specifications they use (including pooled OLS, Fama McBeth and fixed-effects regressions). They also find that fund age is positivey correlated with fee size, perhaps because new funds are subsidized by their sponsors, or older funds with established reputations can charge more. Most importantly, Tufano and Sevick (1997) find that fees are not related to past performance.

Khorana (1996) finds in a sample of 2528 open-end funds during 1979-1992 that there exists a significant and negative relationship between the probability of an individual manager being fired and the lagged change in the fund's assets. The same relationship holds for the lagged change in

[3]The *Mutual fund factbook* published by the Investment Company Institute (the industry's representative) provides the following information: "Of the total $6.392 trillion invested in mutual funds at the end of 2002, $2.667 trillion was invested in equity funds, $1.125 trillion in bond funds, $327 billion in hybrid funds and $2.272 trillion in money market funds. At the end of 2002, 8,256 mutual funds were available to investors."

[4]There are also many theory papers that have focused on the design of compensation schemes for money managers and its implications for portfolio selection and fund performance. Some early papers in this area are: Grinblatt and Titman (1989), Golec (1992), Stoughton (1993) and Heinkel and Stoughton (1994). More recent work includes Admati and Pfleiderer (1997), Das and Sundaram (1999) and Palomino and Prat (2003).

NAV per share. Moreover, he finds a positive, statistically significant relationship between the likelihood of managerial replacement and the portfolio turnover rate of the fund, which can be attributed to window dressing (Lakonishok et al. (1991)).

Chevalier and Ellison (1999) use a sample of 453 individual portfolio managers between 1992-1994 and show that past performance is negatively related with managers' termination. Managers' terminations tend to be higher unconditionally for larger funds, but there does not seem to be a significant effect of fund size on the performance sensitivity of termination. Moreover, termination is more likely in larger fund organizations (based on total assets), but terminations are not significantly more sensitive to performance at the larger fund organizations.

Sirri and Tufano (1998) find that equity mutual fund inflows are sensitive to historical performance, but this sensitivity is not linear. The flow-past performance relationship is positive, as well as economically and statistically signficant only for the funds in the top quintile. For the lowest performing funds there is no link between flows and past performance, while for mid performers the link is positive and statistically significant yet of much smaller magnitude than for the top performers. Moreover, Sirri and Tufano (1998) show that flows are inversely related to the level of fees charged to funds' investors, as well as to changes in the fees. They also have weak evidence that large fund complexes (in terms of total NAV) attract more flows.

Chevalier and Ellison (1999) show that flow reacts quite strongly to past performance and the relationship is strongest for young funds. Moreover, firing a manager of a poorly performing fund may reduce the resulting outflow (i.e. the sensitivity of flow on performance) of funds by about one half.

4 Data and descriptive statistics

The data comes from annual forms NSAR-B that all regulated investment companies are required to file with the SEC. These forms provide information about the contracts between mutual funds and their advisers, the funds' investment strategy, its performance, as well as administrative details. Each investment company has to provide this information for every portfolio (also referred to as "fund", or "series") that it offers to investors.

I collected this information from all the NSAR-B forms that are available from the SEC's online archive, which covers the period 1993-2002. This allows me to track funds through time and see which advisors they have employed, how the contracts between the funds and the advisors have changed and also how the funds' performance varied over time.

Due to missing information in the forms NSAR-B filed with the SEC, I eliminated the observations where no advisor name was available and those that did not specify the fund's investment strategy. I also left out the ob-

servations corresponding to money market funds.

Table 1 shows the number of funds in each investment category each year between 1993-2002. The SEC askes each fund to identify its investment strategy. In particular, equity funds can have one of the following six strategies, in decreasing order of portfolio risk: aggressive capital appreciation, capital appereciation, growth, growth and income, income and total return. The detailed description of these strategies can be found in the appendix. To make the analysis simpler, I combined the aggressive capital appreciation and the capital appreciation funds, and also the growth and income and income funds. Hence I am left with five fund categories: one for bond funds and four for equity funds. The percentage of bond funds out of all funds offered to investors has decreased over time from around 50% in the early part of the sample to 30% in 2002. While percentage of funds in the lower risk equity categories (growth and income, income and total return funds) has varied little over time, the percentage of funds in the higher risk categories (aggressive capital appreciation, capital appreciation and growth funds) has increased from 32% in 1993 to 52% in 2002.

Summary statistics of the main variable for each category of funds are presented in table 2. Bond funds pay, on average, a lower fee (52bp) to their advisors than funds in either of the four equity categories. The highest average rate (82bp) is paid by the highest risk funds, the ones whose investment objective is either aggressive capital or capital appreciation. The average sizes of funds in different categories do not differ by much in log units. In dollars, the average bond fund has assets of about $90 million and the average agressive capital appreciation equity fund has assets worth about $63 million.

Fund family sizes are similar across groups, with bond funds belonging to the smallest families (9.5 portfolios per family, on average). Turnover is lowest for the equity funds with low risk and an income component (67%) and highest for high risk investment funds (123%). Expense reimbursements (as percentage of NAV) from the advisor to the fund are on average similar across fund categories, about 0.2%. Directors' compensation (as percentage of NAV) is 0.02% for bond funds and equity funds with an income component, and 0.03% for the other equity categories. The average market share of advisors of bond funds is slightly higher than for equity funds, indicating that the market for fixed-income investment advice is more concentrated. Finally, funds in all equity categories employ on average more advisors than bond funds.

5 Results

5.1 General description of contracts, firing and hiring patterns

The vast majority of funds compensate their advisors based solely on a percentage of the NAV. For their portfolio selection services, advisors get a certain percentage of the NAV of the fund at the end of the year. I will refer to this as the *marginal rate* paid by the fund. The majority of the contracts in my sample are single-rate contracts, but 33% of funds each year have concave contracts. For these, the rate paid to the advisory firm decreases as the fund's NAV increases. For instance, the fund may pay its advisor 1% of NAV if the NAV is below $10,000,000, 0.75% if the NAV is between $10,000,000 and $20,000,000, and 0.5% for NAV above $20,000,000. The percentage of funds with concave contracts peaks in 1995-1996 when it reaches 37%, and then drops to 32% towards the end of the period examined.

In my sample, 0.21% of contracts specified that the fee is based solely on a percentage of the fund's income, 1.76% specified the fee was based on some combined percentage of the fund's income and its assets, 1.86% specified the fee was based in whole or in part on its investment performance, and 4.23% specified the fee was based in whole or in part upon the assets, income or performance of other funds. Overall, only 7.4% of contracts had any of the above features. The remaining 92.6% of the contracts were solely based on the NAV of the fund.

Table 3 shows how many funds employ one, two or three advisors each year in my sample. The percentage of funds employing only one advisor has decreased steadily from 81% in 1993 to 64% in 2002. More and more funds employ two or three advisers each year. Although it is not clear why this pattern has emerged, arguably it should have an impact on the funds' fees and performance; this matter will be analyzed later in the paper.

Changing advisors is a rare event for mutual funds. This can be seen in Tables 4 and 5. Table 4 shows that the percentage of funds separating from an advisor varies between 5.88% in 1994 and 15.89% in 2001. These separations are offset by hiring new advisers: the percentage of funds hiring new advisors varies between 5.70% in 1995 and 15.81% in 2001. At first sight the numbers in table 4 seem to be related to patterns of the stock market: there are more separations and more hiring activity during years with higher market volatility.

Table 5 shows that 70.77% of the funds that I track through time do not ever change their advisers. 21.33% of the funds change advisors only once, and 7.9% do so more than once. Moreover, the separating decisions that I observe in the sample are almost always followed by the hiring of a new advisor. Hence, a vast majority of the mutual funds seem to enter in a contractual agreement with a set of advisors and then never fire either

one of the advisers, nor hire additional ones, for as long as they stay in my sample.

One can argue that changing advisors is a costly process: mutual funds have to mail proxies to shareholders and ask for their vote regarding the proposed change. Funds may have to hire consultants to find the best candidates among all investment advisory firms and then inform the funds' directors about the available options. There may be severance costs, as well as legal costs of signing on new managers. Changing advisors may cause a negative reaction on behalf of the shareholders. I shall show later that these costs alone can not justify the low switching rate of advisers. A more believable explanation is that boards of directors are controlled by the funds' advisers, mainly by the principal adviser, and thus do not have incentives to be more actively searching for better providers of advisory services.

Funds are not active at renegotiating the advisory contracts, either. Tables 6 and 7 show how seldom funds renegotiate their single-rate contracts with the investment advisers. I did not include observations for funds with concave contracts, since their marginal rates change endogenously as the NAV changes. In table 6 one can see that each year more than 90% of funds with single-rate contracts do not renegotiate their rates. The highest percentage of renegotiations happen in 2000 when 5.9% of funds decreased the rates paid to advisers, and 2.27% increased the rates. Every year, rates are lowered more often than they are increased, which may indicate that the cost of advisory services has been decreasing over time. However, as I will show later, this does not necessarily mean that the fees paid to advisors have been decreasing.

It seems that the vast majority of funds never renegotiate the fee paid to their investment advisers. Table 7 shows that 90.48% of the funds I track over time never decrease the rate, 8.7% decrease it once and less than 1% of funds decrease it more than once during the time they are in my sample. The number of funds increasing the advisory fee is smaller, with less than 5% of funds having to increase the rate at least one time.

5.2 Determinants of the advisory fee

According to Figure 1 on average there has been no significant change during 1993-2002 in the advisory fees paid by mutual funds in any of the five investment objective categories I analyze.

Table 8 shows the factors that influence the size of the rate paid by mutual funds to their advisers. As in Coles et al. (2000) and Deli (2002), I find that equity funds pay a significantly larger rate to their advisors than fixed-income funds. Aggressive capital accumulation and growth funds have

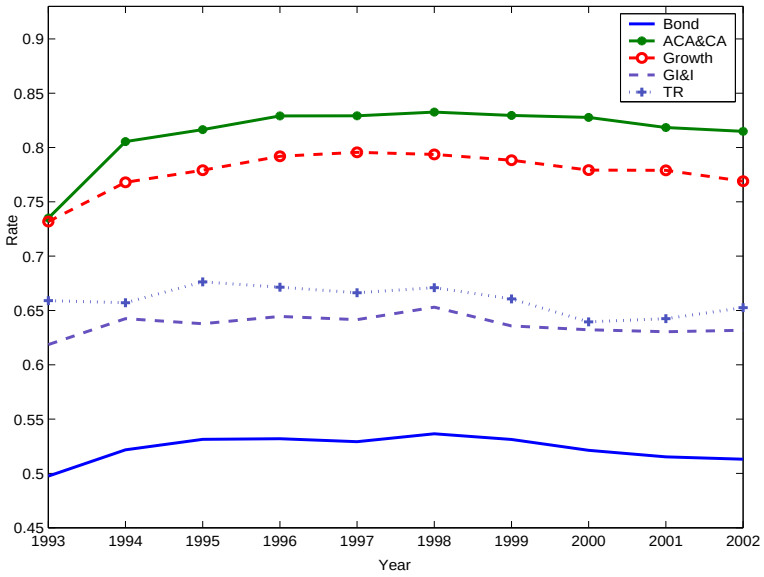

Figure 1: Mean rate paid to advisors by funds with various investment objectives. **Bond**=fixed income funds. All other symbols refer to equity funds, as follows: **ACA & CA**=aggressive capital appreciation funds and capital appreciation funds; **G**=growth funds; **GI&I**=growth and income funds, as well as income funds; **TR**=total return funds. See appendix for the detailed description of these investment objectives.

the most sensitive rates (26 bp more than bond funds). Growth and income, income, and total-return funds have lower rates, which are still between 14-20 bp above bond funds' rates.

Index funds pay 36 bp less than similar non-idex funds, and funds investing primarily in domestic securities pay 12bp less than similar funds investing in foreign securities. These findings suggest that the advisory fee accounts for differences in the fund's ability to monitor the effort of the adviser, as well in the advisor's marginal product. Arguably, it takes more research and more skill to determine the optimal holdings of a foreign high risk equity portfolio than of a domestic fixed-income portfolio. An index fund's advisor can be monitored more easily than the advisor of an actively managed fund, as the task of the former is very well defined.

I also find that larger funds and funds from larger families pay a lower rate. This effect is robust across all four specifications in table 8. For a typical fund (using the estimated coefficient for $lnNAV$ from the pooled OLS regression, i.e. 0.0233), if its assets grow from \$50 million to \$100 million, the advisory fee decreases by 1.6 bp. If the assets grow from \$100 million to \$150 million, the fee decreases by 1 bp. Moreover, for each additional portfolio added to a fund's family, the rate paid by the fund decreases by 0.1 bp.

This is consistent with the results in Deli (2002), Tufano and Sevick (1997) and Coles et al. (2000). It could reflect potential economies of scale

as well as the impact of funds' bargaining power on fee setting.

Funds experiencing higher turnover pay their advisors a higher rate, as was previously shown in Deli (2002). This would be consistent with funds using turnover as a noisy estimate of adviser's effort to determine compensation. It is interesting that the turnover effect is not significant in the fixed-effects specification in table 8, but it is significant in the other three specifications. In particular, the between estimator indicates that if on average a fund has turnover 100% higher than another, the first fund pays a rate 1bp higher than the second one. So, turnover does not seem to be used as a monitoring device by the funds' boards, as there is no connection between it and the advisory fee in a fixed-effects model.

However, the statistically significant effect observed in the between estimator indicates that turnover is specified ex-ante. In other words, the board and the advisor decide upon a fund objective as well as a turnover rate (maybe to keep portfolio trading costs within a specified range) and given these values, they agree upon a fee. The year-to-year changes in turnover are not reflected in the subsequent advisory fee, perhaps because the advisor has managed to keep turnover in the pre-specified range. In support of this hypothesis I find (in a regression not included here) that turnover is significantly and negatively related to its one-year lag, which indicates that fund advisors try to keep it relatively stable over time. In the same regression I also find that older funds have a lower turnover rate and that turnover increases significantly upon the replacement of an advisor. Moreover, I find that turnover is not a predictor of expense reimbursements from the advisor to the fund, but performance is: the lower the performance, the higher the reimbursements. Performance is also strongly and negatively predicted by turnover. All this evidence points to an ex-post renegotiation mechanism whereby advisors "make-up" for bad performance (possibly caused by excess turnover) by returning a part of the advisory fee to the fund.

Table 8 also shows that open-end funds pay on average 4 bp less than similar closed-end fund. As investors can not punish advisers for bad performance by taking their money out, closed-end fund must employ stronger incentive schemes to align the interests of the manager with those of the shareholders. A rate more sensitive to NAV may compensate for the restrictions imposed on investors' actions.

Funds with concave contracts pay on average 3bp less than their single-rate counterparts. I am not sure what is the explanation for this finding, but it could be that funds which have been able to implement concave compensation schemes are probably in a better bargaining position than the other funds, and can convince their advisors to accept a lower pay. It could also be that concave funds perform better and thus can have economies of scale reflected in lower rates, but I did not see this effect when running the performance regressions.

In my sample, the fund's age does not seem to impact the size of the rate. The extant evidence is mixed: Tufano and Sevick (1997) find in their sample of U.S. open-end funds that older funds charge higher investor fees. Coles et al. (2000) find the opposite result in a sample of closed-end mutual funds. My sample has both closed and open end funds, and I did not separate the impact of fund age by subsample.

Moreover, I find some evidence (in the random effects GLS model in table 8) that the compensation given to the board of directors (as a percentage of NAV) has a significant and positive impact on the rate paid to the funds' advisers. Tufano and Sevick (1997) find the same result in their sample, and argue that this could signal an endogeneity problem, in that advisors that charge higher fees choose a board that will approve these fees. Given the regulation of mutual fund boards - in particular their duty to act solely in the interest of the funds' investors when negotiating fees and choosing advisors - this result seems to suggest that the directors may respond to incentives offered by the principal advisor to the detriment of investors.

Some of my novel findings address the impact of past performance, adviser change decisions and advisors characteristics on the size of the fee.

The evidence on the dependence of fees on past performance is mixed. In their study of money managers of all-equity pension funds, Lakonishok et al. (1992) find that the impact of past performance on fees is small: an extra 300 bp in raw returns per year over the past five years translates into only an extra 5 to 6 basis points in management fees. The the R-squared of their regression indicated that past performance over the past five years alone can only explain 5% of the variation in fees.

A different conclusion is reached by Tufano and Sevick (1997). In their data, there was no statistically significant relationship between past performance and current fees. This may be because the model estimated in that paper did not allow for a different impact of performance on rates, depending on the range of performance.

I employ the method in Sirri and Tufano (1998) to obtain the slope of the relationship between past performance and the rate, in three regions: bottom two deciles (low performers), middle six deciles (mid performers), and top two deciles (top performers). As can be seen in table 8, the impact of past performance on the fee differs across these regions: the coefficient is significant and negative for bottom and mid performers, and significant and positive for the top performers. It could be that the top performing funds are trying to retain their "star" advisor by paying them more the better they do, while the other funds may try to extract some economies of scale from their own advisors upon good performance.

From the fixed and random-effects specifications in table 8 one can see that upon changing advisers, funds decrease the compensation rate by about 2bp. Switching advisors is a natural opportunity for funds to renegotiate rates, and it seems that they indeed do so.

In three of the specifications in Table 8 the average market share of the advisors of a fund is significant and negatively related to the size of the rate. In one of my specifications, the average historical performance of a fund's advisors is also significant and negatively related to the compensation. Arguably, these results could stem from economies of scale being passed down from the advisors to the fund's investors, but they can also be consistent with other stories.

Another result is that funds that employ more advisors pay a higher rate overall (between 1 and 2 bp per additional advisor). In regressions not reported here I find that the number of advisors is negatively related to performance (the coefficient on number of advisors is significant in some, not all, specifications, but it is negative in all of them). Hence, employing more advisors seems to increase the fee paid by the fund without leading to better returns.

5.3 Determinants of the funds' decision to change advisors

The number of funds employing more than one advisor has steadily increased over time, as can be seen in Table 3. While the principal advisor of a fund is not changed very often, the secondary advisors are. I estimate a logit model of a fund's decision to change advisers, and ajust the standard errors by clustering observations by fund identifier. The results are shown in table 9.

Panel A in table 9 shows that the likelihood of a fund changing its advisors decreases with the fund's recent past performance. This result mirrors the previous findings of Chevalier and Ellison (1999) and Khorana (1996) about the determinants of firing of individual portfolio managers. Panel B shows that mutual funds that are in the middle and top quartiles of performance for their investment objective are significantly less likely to separate from an advisor in the following year. This is consistent with a setting where funds learn about the skill of advisory firms and switch away from lower types over time.

Funds in large complexes are more active at changing advisers. A similar result was obtained by Chevalier and Ellison (1999) in the context of changing individual fund managers. This suggests that one of the proposed explanations for the relatively low frequency of firing advisors may not be the true story. Transaction costs, such as the costs of sending out proxies to request shareholder approval of an advisory change, are arguably higher for bigger funds, which tend to have a more disperse set of shareholders. However, the results in table 9 indicate that these costs do not prevent funds belonging to large complexes from changing advisers.

There is also a significant positive relationship between a fund being an index fund or dealing with foreign securities, and the likelihood that it will undergo an advisor change. To the extent that mutual funds believe in the

existence of advisors' skill, one would expect to see more firing behavior for index funds. For these funds no long-term learning or updating of beliefs about the advisor's ability is necessary, as the advisor's task is clearly defined (hold an exogenously specified set of securities) and requires no investment research skill.

The positive relationship between a fund investing in foreign securities and the likelihood of separating from an advisor is less intuitive in an asymmetric information setting. However, in an unreported random effects GLS regression of fund performance on various fund characteristics I find that mutual funds primarily investing in foreign assets significantly underperform their domestic counterparts. The persistent relative poor performance of foreign funds may induce the higher separation rate reported in table 9.

Panels A and B also show that high volatility equity fund categories (aggressive capital appreciation, capital appreciation and growth) exhibit a significantly higher advisor separation rate than fixed-income funds. This finding together with the previous result about foreign securities funds being more likely to separate from advisors than their domestic counterparts indicate that firing and hiring decisions may be made differently in environments characterized by higher uncertainty (return volatility) or more difficult monitoring. It could be that advisor skill is important in such high uncertainty environments, such as high risk equity investments. In such environments, the threat of firing could be a disciplining device which compensates for the difficulty in monitoring the advisors' activity and learning about the advisor's type.

Moreover, the regressions in table 9 shows that funds whose current advisors have a large market share are less likely to separate from either one of the advisers. This could be an indication that when advisor firms have "clout" in the market place, they can retain a client independent of their performance. Also, funds are less likely to separate from one of their advisors the higher the advisors average historical performance. Since in many instances the portfolio management services are done jointly by two or more advisors, funds may not be able to infer exactly the skill level of individual advisory firms, and thus they may base firing decisions on the average performance of the current advisors.

High turnover is also a predictor of future separations between funds and advisors. Although the effect is not economically significant, it is statistically significant in panels A and B of table 9. This finding is surprising, given the results in table 8 where high turnover is associated with higher advisory fee in a between-estimator regression. As pointed out before, in that table turnover is not a significant predictor of advisory rates in a fixed-effects model. Putting together the results in tables 8 and 9, it seems turnover is used for determining firing decisions rather than rate changes.

Table 9 also shows that funds with concave contracts and funds without performance fees are less likely to change advisers. Also, the higher the

expense reimbursements by a fund's advisors to the fund, the less likely is the fund to change its advisers. This could mean that advisors show good will by returning some of the fees they were paid, to compensate for poor fund performance and to retain the fund as a client in the future. This effect, however, is only significant in the conditional logit regression in Panel C of table 9.

5.4 Impact of contractual changes on the funds' short-term performance

Table 10 shows the impact of adviser changes and rate renegotiation on changes in one-year performance.

In panel B the coefficients on the dummy variables indicating a decrease or an increase of the advisory rate are statistically significant and of opposite signs. If the advisory rate is increased, subsequent one-year performance decreases on average by 1.11 deciles. If the rate paid to the advisors is decreased, next year's performance in terms of rank or decile will improve on average by 0.55. It could be that this increase in performance, when translated into increase in raw returns, matches exactly the decrease in rate. This would be an indication of cost reduction for funds, without impact on advisers' effort. However, if one believes that rates go down as a prelude to firing the adviser, then performance should improve by more than the rate cut, as the advisor works harder and tries to convince the fund not to severe the relationship. Evidence for this hypothesis comes from table **??** where turnover is a predictor of separations in the following year. It could also be the case that a rate decrease will make the advisor work harder to compensate for the cut by increasing the size of the fund and thus the pay it receives, or that it will cause the advisor to decide to slack off and look for different funds to manage where the pay rate is better.

For now, I can not tell which one of these stories is more likely to be true. All I can establish using my performance measure (based on decile within the fund's category) is that following a rate cut, performance increases.

Panels A and B of table 10 show that changing advisors has a different impact for funds in different deciles of performance.

If a bottom performer changes its advisers, its subsequent performance will not change significantly. Middle performing funds which undergo an adviser change will improve their performance ranking by 0.23 deciles on average. A top performer parting with one of its current advisors will experience a drop in rank next year by about 0.4 deciles. The last two effects are statistically and economically significant.

These findings are consistent with the possibility that there exists some short-term persistence in advisors performance. Evidence for top-performers persistence was documented in Hendricks et al. (1993), Grinblatt and Titman (1992) and Ibbotson and Goetzmann (1994). Thus a top performing fund

separating from one if its advisor may lose the persistence benefit and perform worse next year, which is what the performance change regressions in table 10 indicate may be happening.

My finding that changing advisors does not help future rankings for bottom performing funds is consistent with the result in the mutual fund performance literature that performance is more persistent for funds in the bottom deciles (Hendricks et al. (1993)).

Table 10 indicates that for funds in the three middle quintiles of performance, it is beneficial to switch advisers. Hence, there could be significant value in firing mediocre performing advisors and holding on to well performing ones.

Given these results, it is puzzling to see how few advisor changes take place, and how few times the rate is negotiated down. Contractual changes seem to benefit the funds, hence the funds' shareholders, yet it occurs very rarely. These observations justify questioning the effectiveness of the board of directors of mutual funds, as the directors are the party obligated by fiduciary duty to select advisors and renegotiate their contracts each year.

5.5 Impact of contractual changes on the funds' short-term net inflows

The results of regressing the net inflows on various fund characteristics are shown in table 11. I define the net inflows as $\frac{NAV_t}{NAV_{t-1}} - RawReturn_t$ (where $RawReturn_t$ is based on the change in the net asset value per share from year $t-1$ to t and includes dividends and distributions) to capture the rate of *new* flows into the fund.

In all the three specifications employed I find that flows react strongly to past performance of funds in the top quintile. In the between estimator and random GLS regression specifications, flows are also significantly related to past performance for mid performers too. The sensitivity to past performance is much higher for top than for middle performers: the random effects GLS estimated coefficients are 0.15 and 0.03, respectively. Hence, I obtain a similar result to Sirri and Tufano (1998): the relationship between fund performance and subsequent net inflows is convex. There is no link for funds in the bottom quintile, and the sensitivity of flows to performance is five times larger for the funds in the top quintile than for ones in the middle three quintiles. This can be seen as evidence that investors do not vote with their feet: they flock to last year's winners and do not seem to abandon poorly performing funds.

Moreover, bigger funds tend to receive net inflows at a lower rate. This result is robust across all the specifications in table 11. I do not find that the size of a fund's family has a significant impact on net inflows.

Separating from an advisor does not have a statistically significant impact on the sensitivity of subsequent net inflows on past performance, in any

of the three specifications in table 11. The only exception is in the between-effects regression, where separations for top-performing funds reduce the sensitivity of net inflows to past performance by 54%.

These findings go against the argument that costs associated with investors reaction upon a change in advisors (i.e. investors pulling money out of the fund) can explain why advisors do not get replaced more often.

The random-effects GLS regression in table 11 also shows that investors are sensitive to rate changes, in a asymmetric way. If rates are decreased, the rate of net inflows increases significantly, by 43% on average. If rates are increased, the net inflows decrease only by 12% and the effect is not statistically significant. These results are consistent with the findings of Sirri and Tufano (1998), who find that flows are inversely related to changes in the fees charged to investors.

Hence, as in the case of performance, it seems that net inflows respond positively to a fund's decision to renegotiate down advisory rates. This result together with the previous finding that 90% of the funds do not change the fee paid to their advisors are another indication that the observed contractual stickiness is not beneficial to mutual funds' investors.

6 Conclusion

In this paper I construct a new data set of contracts between mutual funds and their investment advisors by extracting information from the forms NSAR-B filed by each fund with the SEC between 1993-2002.

First, I document that advisory contracts are sticky: funds and their advisors do not separate often, and advisory fees do not change much through time. Second, I document cross-sectional and time-series characteristics of advisory contracts. I show that fee setting as well as firing and hiring decisions regarding the advisory firms are not only related to performance, but to other variables which are indicative of frictions and conflicts of interest in this industry. Last, I show that for most of the mutual funds that renegotiate down the advisory rate or switch advisors following mediocre performace, these changes have economically and statistically significant positive effects on subsequent performance. The finding that advisory contracts are sticky and at the same time that contract renegotiation is beneficial to mutual funds indicates that there are inefficiencies in the asset management industry.

A likely explanation is that boards of directors of funds, whose job is to negotiate the contracts and find the best advisers, are not acting in the interests of investors due to conflicts of interes. Directors may be nominated by the advisory firms themselves and may receive perks in exchange for less active monitoring. While this paper does not provide evidence that indeed this is the case, it does make the point that there could be contractual

inefficiencies in the asset management industry. These can be addressed by changes in mutual fund regulation, in particular about funds governance. Fortunately, the SEC is currently considering such regulatory changes in the wake of recent abuses (market timing, late trading, preferrential treatment of certain fund investors) that have been documented at several mutual fund companies[5]. The results presented here support the SEC's proposed rule to improve the disclosure regarding the approval of advisory contracts by the directors of mutual funds.

Better disclosure, however, is not going to be necessarily enough to ensure that the directors make the optimal advisor choice. This could be the case in the instances where the fund directors are actually nominated by the advisory firm itself. Hence, it would be beneficial to ask that the fund's investors choose the advisor and the fee every year, instead of leaving this task to the board. The board will have to propose several alternatives for advisors in the annual proxy statement sent to investors, and let them make the final choice. Not only will this lead to a more fair contract between the fund and the advisor, but will also help investors get a better understanding of the fund's performance and hopefully make better fund choices in the future.

Clearly, more work on fund corporate governance is required before a final statement can be made about the source of the inefficiencies documented in this paper. Moreover, a thorough analysis of all of the decision layers (a) through (e) in the asset management industry should be done to understand how agents involved in one decision layer respond to the strategies employed by other agents. This analysis will allow us to understand the industry better and point out potential problems, such as frictions, conflicts of interests and imperfect competition, that could later be addressed by changes in regulation.

Appendix: Classification of funds investing in equity securities

Excerpt from the SEC's General Instructions for filing form NSAR. (Online at http://www.sec.gov/about/forms/formn-sar.pdf)

"A registrant/series with an investment objective of **aggressive capital** appreciation is one that primarily and regularly seeks short-term appreciation through high-risk investment, with little or no concern for receipt of income.

[5]For an overview of the recent mutual fund problems discussed by the media, please see the special report "Perils in the savings pool" in *The Economist*, vol. 369, number 8349, pp. 65-67.

A registrant/series with an investment objective of **capital appreciation** is one that primarily and regularly invests for an intermediate-term return by investing in moderate to high-risk securities, with little or no concern for receipt of income.

A registrant/series with an investment objective of **growth** is one that seeks long-term growth, with a moderate degree of risk. Receipt of income may be considered to some degree in selecting investments.

A registrant/series should place a "Y" beside sub-item 66E, **growth and income**, if it primarily and regularly makes low-risk investments with the objective of capital growth and income production.

A registrant/series should place a "Y" beside sub-item 66F, **income**, if the receipt of income is the primary reason for selecting portfolio securities.

A registrant/series whose portfolio includes a varying mix of equity and debt securities should place a "Y" beside sub-item 66G, **total return**."

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Table 1: Funds, by investment objective. **Bond**=fixed income funds. All other symbols refer to equity funds, as follows: **ACA & CA**=aggressive capital appreciation funds and capital appreciation funds; **G**=growth funds; **GI&I**=growth and income funds, as well as income funds; **TR**=total return funds. See appendix for the detailed description of these investment objectives.

	Fund category					
Year	**Bond**	**ACA&CA**	**G**	**GI & I**	**TR**	Total
1993	429	165	136	102	82	914
	46.94%	18.05%	14.88%	11.16%	8.97%	100%
1994	1,571	603	340	332	222	3,068
	51.21%	19.65%	11.08%	10.82%	7.24%	100%
1995	2,268	973	543	494	304	4,582
	49.50%	21.24%	11.85%	10.78%	6.63%	100%
1996	2,402	1,240	694	627	376	5,339
	44.99%	23.23%	13.00%	11.74%	7.04%	100%
1997	2,495	1,468	826	678	508	5,975
	41.76%	24.57%	13.82%	11.35%	8.50%	100%
1998	2,635	1,856	993	779	528	6,791
	38.80%	27.33%	14.62%	11.47%	7.77%	100%
1999	2,682	2,029	1,083	797	585	7,176
	37.37%	28.27%	15.09%	11.11%	8.15%	100%
2000	2,828	2,466	1,300	861	667	8,122
	34.82%	30.36%	16.01%	10.60%	8.21%	100%
2001	2,673	2,650	1,432	834	664	8,253
	32.39%	32.11%	17.35%	10.11%	8.05%	100%
2002	2,757	3,015	1,698	854	724	9,048
	30.47%	33.32%	18.77%	9.44%	8.00%	100%
Total	22,740	16,465	9,045	6,358	4,660	59,268
	38.37%	27.78%	15.26%	10.73%	7.86%	100%

Table 2: Summary statistics. **Bond**=fixed income funds. All other symbols refer to equity funds, as follows: **ACA & CA**=aggressive capital appreciation funds and capital appreciation funds; **G**=growth funds; **GI&I**=growth and income funds, as well as income funds; **TR**=total return funds. See appendix for the detailed description of these investment objectives. For funds with concave contracts, AMR_t is the rate that corresponds to the fund's current NAV. For single-rate contracts, AMR is the unique rate specified in the contract. $lnNAV$ is the log of the fund's NAV, which is expressed in thousands of \$'s. $FamilySize$ is the number of portfolios in the fund's family. $Turnover$ is the fund's turnover rate, expressed in percentage points. $ExpenseReimb$ represents the reimbursed expenses as a percentage of NAV. $DirectorsComp$ is the percentage of the NAV paid as compensation to the fund's directors. $avgMSAdv$ is the average market share of the fund's advisors and $\#ofadvisers$ is the number of advisors of the fund.

	Bond		**ACA & CA**		**G**		**GI & I**		**TR**	
Variable	Mean	Std. Dev.	Mean	Std. Dev.	Mean	Std. Dev.	Mean	Std. Dev.	Mean	Std. Dev
AMR	0.5250	0.1851	0.8225	0.2933	0.7813	0.2798	0.6380	0.2428	0.6575	0.2683
$lnNAV$	11.4386	1.7617	11.0570	2.1111	11.4180	2.2585	11.6499	2.1705	11.3036	2.2119
$FamilySize$	9.5710	10.9538	12.5857	13.3730	11.3174	11.5050	10.5930	10.8118	12.5045	11.4218
$Turnover$	96.2008	176.5664	123.8704	337.7939	88.5512	170.8017	67.0749	180.8045	81.6479	187.2425
$ExpenseReimb$	0.0020	0.0047	0.0029	0.0066	0.0025	0.0062	0.0018	0.0049	0.0024	0.0058
$DirectorsComp$	0.0002	0.0013	0.0003	0.0019	0.0003	0.0021	0.0002	0.0010	0.0003	0.0017
$avgMSAdv$	0.0114	0.0230	0.0091	0.0222	0.0099	0.0217	0.0106	0.0238	0.0084	0.0196
$\#ofadvisers$	1.2405	0.5025	1.4661	0.6730	1.4723	0.6540041	1.4108	0.6332	1.4367	0.6230

Table 3: Funds, by number of advisors employed. Includes funds with either single rate or concave contracts. No fund longevity requirement imposed.

	# advisors employed			
Year	1	2	3	Total
1993	745	125	44	914
	81.51%	13.68%	4.81%	100%
1994	2,338	580	150	3,068
	76.21%	18.90%	4.89%	100%
1995	3,554	806	222	4,582
	77.56%	17.59%	4.85%	100%
1996	3,925	1,133	281	5,339
	73.52%	21.22%	5.26%	100%
1997	4,243	1,337	391	5,971
	71.06%	22.39%	6.55%	100%
1998	4,752	1,571	464	6,787
	70.02%	23.15%	6.84%	100%
1999	4,841	1,794	537	7,172
	67.50%	25.01%	7.49%	100%
2000	5,557	1,993	572	8,122
	68.42%	24.54%	7.04%	100%
2001	5,568	2,036	647	8,251
	67.48%	24.68%	7.84%	100%
2002	5,785	2,455	808	9,048
	63.94%	27.13%	8.93%	100%

Table 4: Hiring and separation behavior of funds which are in the sample for at least two years.

	Hired new IA?		Separated from IA?		
Year	No	Yes	No	Yes	Total
1994	646	51	656	41	697
	92.68%	7.32%	94.12%	5.88%	100%
1995	2,381	144	2,372	153	2,525
	94.30%	5.70%	93.94%	6.06%	100%
1996	3,323	450	3,440	333	3,773
	88.07%	11.93%	91.17%	8.83%	100%
1997	4,068	536	4,146	458	4,604
	88.36%	11.64%	90.05%	9.95%	100%
1998	4,650	626	4,657	619	5,276
	88.13%	11.87%	88.27%	11.73%	100%
1999	5,111	533	5,135	509	5,644
	90.56%	9.44%	90.98%	9.02%	100%
2000	5,822	621	5,783	660	6,443
	90.36%	9.64%	89.76%	10.24%	100%
2001	5,670	1,071	5,670	1,071	6,741
	84.11%	15.89%	84.11%	15.89%	100%
2002	6,417	1,070	6,472	1,015	7,487
	85.71%	14.29%	86.44%	13.56%	100%

Table 5: Funds, by the number of advisor changes they experience during 1994-2002. Funds have to be in the sample for at least two years.

#changes	how often separated from an IA?		how often hired a new IA?	
	Freq.	Percent	Freq.	Percent
0	8,651	70.77%	8,561	70.03%
1	2,607	21.33%	2,611	21.36%
2	739	6.05%	784	6.41%
3	152	1.24%	180	1.47%
4	62	0.51%	63	0.52%
5	10	0.08%	21	0.17%
6	2	0.02%	3	0.02%
8	1	0.01%	1	0.01%
Total	12,224	100%	12,224	100%

Table 6: Rate changes experienced each year by funds with single rate contracts. All concave contracts excluded. Funds must be in the sample for at least two years to be included.

Year	Rate decreased	Rate increased	Rate unchanged	Total
1994	17	11	392	420
	4.05%	2.62%	93.33%	100%
1995	27	20	1,357	1,404
	1.92%	1.42%	96.65%	100%
1996	48	40	1,920	2,008
	2.39%	1.99%	95.62%	100%
1997	67	52	2,463	2,582
	2.59%	2.01%	95.39%	100%
1998	73	59	2,863	2,995
	2.44%	1.97%	95.59%	100%
1999	116	46	3,058	3,220
	3.60%	1.43%	94.97%	100%
2000	223	86	3,473	3,782
	5.90%	2.27%	91.83%	100%
2001	140	82	3,773	3,995
	3.50%	2.05%	94.44%	100%
2002	205	117	4,136	4,458
	4.60%	2.62%	92.78%	100%

Table 7: Rate changes for funds with single rate contracts. All concave contracts excluded. Funds must be in the sample for at least two years to be included.

#changes	how often decreases the advisory fee?		how often increases the advisory fee?	
	Freq.	Percent	Freq.	Percent
0	7,177	90.48%	7,569	95.42%
1	690	8.70%	323	4.07%
2	52	0.66%	32	0.40%
3	10	0.13%	6	0.08%
4	3	0.04%	2	0.03%
Total	7,932	100%	7,932	100%

Table 8: Determinants of applicable marginal rate (AMR_t). For funds with concave contracts, AMR_t is the rate that corresponds to the fund's current NAV. For single-rate contracts, AMR is the unique rate specified in the contract. Each year funds are assigned to category-specific performance deciles by comparing their returns to those of the other funds in the same category. The bottom performance grouping, $LOWPERF_t$, combines the lowest two deciles and is defined as $min(Decile_t, 2)$. The middle six performance deciles are combined in one grouping, $MIDPERF_t$, defined as $min(6, Decile_t - LOWPERF_t)$ The top two deciles are combined in one group, $HIGHPERF_t$, defined as $Decile_t - (LOWPERF_t + MIDPERF_t)$. This procedure is used in Sirri and Tufano (1998). Coefficients on the piecewise decompositions of performance represent the slope of the performance-AMR relationship in their range of sensitivity. SA_t is a dummy variable equal to 1 if one of the fund's advisors at time t is not among the fund's advisors at $t+1$. $Turnover_t$ is the fund's turnover rate, expressed in percentage points. $lnNAV_t$ is the log of the fund's NAV, which is expressed in thousands of \$'s. $FamilySize_t$ is the number of portfolios in the fund's family. Age_t is the fund's age in years. $DirectorsComp_t$ is the percentage of the NAV paid as compensation to the fund's directors. $\#ofadvisers_t$ is the number of advisors of the fund. $avgLMSAdv_t$ is the average market share in the previous year of the fund's current advisers. $avgHPAdv_t$ is the average of the fund's advisors historical performance. $OpenEnd_t$ is a dummy variable equal to 1 for open-end funds. $Index_t$, $Foreign_t$ and $isConcave_t$ are dummy variables equal to 1 if the fund is an index fund, if it holds foreign securities, or if the advisory contract is concave, respectively. Equity funds dummies are as follows: **ACA & CA**=aggressive capital appreciation funds and capital appreciation funds; **G**=growth funds; **GI&I**=growth and income funds, as well as income funds; **TR**=total return funds. Bond funds are the base category (dummy not included). Fixed-effects regression: F(29,13095)=14.11. Between regression (on group means): F(30,6715)=135.17. Random-effects GLS regression: Wald chi2(30)=2781.92. Pooled OLS regression: F(30,6745)=108.49. Number of obs=19870, number of clusters (funds) = 6746.

	Fixed-effects		Between effects		Random effects		Pooled OLS	
AMR_t	Coef.	t	Coef.	t	Coef.	z	Coef.	t
$LOWPERF_{t-1}$	-0.0054	(2.78)**	-0.0866	(5.87)**	-0.0070	(3.45)**	-0.0447	(6.54)**
$MIDPERF_{t-1}$	-0.0002	(0.64)	-0.0110	(4.65)**	-0.0004	(1.36)	-0.0059	(6.18)**
$HIGHPERF_{t-1}$	0.0005	(0.51)	0.0573	(8.18)**	0.0024	(2.38)**	0.0316	(8.88)**
$LOWPERF_{t-1} * SA_{t-1}$	0.0128	(2.01)**	-0.0563	(1.27)	0.0130	(2.00)**	-0.0101	(0.49)
$MIDPERF_{t-1} * SA_{t-1}$	-0.0004	(0.43)	0.0140	(1.98)**	0.0001	(0.12)	-0.0001	(0.04)
$HIGHPERF_{t-1} * SA_{t-1}$	-0.0016	(0.47)	-0.0035	(0.14)	-0.0017	(0.50)	0.0105	(0.92)
SA_{t-1}	-0.0232	(2.10)**	0.0607	(0.77)	-0.0256	(2.26)**	0.0084	(0.23)
$Turnover_{t-1} * 10^3$	0.0053	(1.36)	0.1000	(11.25)**	0.0194	(5.09)**	0.1000	(2.04)**
$Openend_t$	-0.0270	(1.36)	-0.0392	(3.43)**	-0.0410	(4.28)**	-0.0526	(4.52)**
$lnNAV_{t-1}$	-0.0041	(4.08)**	-0.0227	(13.43)**	-0.0102	(11.54)**	-0.0233	(12.23)**
$FamilySize_{t-1}$	-0.0011	(6.39)**	-0.0011	(4.10)**	-0.0011	(7.65)**	-0.0014	(4.42)**
$Foreign_t$	0.0036	(0.61)	0.1261	(15.83)**	0.0670	(13.80)**	0.1274	(13.16)**
$Index_t$	-0.0692	(5.38)**	-0.3654	(25.55)**	-0.1960	(19.89)**	-0.3599	(26.11)**
Age_t	-0.0002	(0.28)	0.0016	(0.78)	-0.0050	(3.79)**	0.0002	(0.13)
$DirectorsComp_t$	1.5890	(1.65)	-1.4935	(0.76)	2.3107	(2.58)**	-0.5664	(0.42)
$avgLMSAdv_t$	0.0671	(0.68)	-0.7151	(3.52)**	-0.1791	(1.95)*	-0.7892	(4.25)**
$avgHPAdv_t$	-0.0007	(1.05)	-0.0028	(1.16)	-0.0015	(2.29)**	-0.0021	(0.91)
$\#advisors_t$	0.0106	(5.31)**	0.0169	(3.20)**	0.0111	(5.80)**	0.0184	(3.80)**
$isConcave_t$	-0.0336	(8.51)**	-0.0268	(4.46)**	-0.0312	(9.23)**	-0.0356	(5.72)**
$ACA\&CA_t$	0.0598	(7.96)**	0.2720	(37.33)**	0.1863	(36.30)**	0.2678	(30.71)**
G_t	0.0494	(6.44)**	0.2451	(27.99)**	0.1675	(30.60)**	0.2509	(24.87)**
$G\&I_t$	0.0144	(1.88)*	0.1393	(14.27)**	0.1026	(17.88)**	0.1426	(15.59)**
TR_t	0.0153	(1.99)**	0.1544	(14.69)**	0.0982	(16.18)**	0.1612	(14.01)**
$cons$	0.7338	(33.36)	1.0297	(28.63)**	0.7766	(48.55)**	0.9449	(32.69)**
Year Fixed Effects	Yes		Yes		Yes		Yes	
R-sq	0.0303		0.3765		0.3455		0.3668	

Table 9: Determinants of advisor change. Each year funds are assigned to category-specific performance deciles ($Performance_t$) by comparing their returns to those of the other funds in the same category. SA_t is a dummy variable equal to 1 if one of the fund's advisors at time t is not among the fund's adviser in year $t+1$. $Turnover_t$ is the fund's turnover rate. $lnNAVt$ is the log of the fund's NAV. $FamilySize_t$ is the number of portfolios in the fund's family. Age_t is the fund's age in years. $DirectorsComp_t$ is the percentage of the NAV paid as compensation to the fund's directors. $ExpenseReimb_t$ represents the reimbursed expenses as a percentage of NAV. $avgMSAdv_t$ is the average market share of the fund's current advisers. $avgHPAdv_t$ is the average of the fund's advisors historical performance. $OpenEnd_t$ is an indicator variable equal to 1 for open-end funds. $Index_t$, $Foreign_t$ and $isConcave_t$ are dummy variables equal to 1 if the fund is an index fund, if it holds foreign securities, or if its advisory contract is concave, respectively. $FeeSolBasedOnNAV_t$ is a dummy variable equal to 1 if the advisory fee is based on NAV only, without any performance component. Equity funds dummies are as follows: **ACA & CA**=aggressive capital appreciation funds and capital appreciation funds; **G**=growth funds; **GI&I**=growth and income funds, as well as income funds; **TR**=total return funds. Bond funds are the base category (dummy not included).Standard errors are adjusted for clustering on fund ID. Panel A logit: Number of obs: 19138, Wald chi2(25)=411.14; Panel B logit: Wald chi2(26)=409.39; Panel C conditional logit: Number of obs: 5182. LR chi2(25)=203.50.

	PANEL A		PANEL B		PANEL C	
SA_t	Coef.	z	Coef.	z	Coef.	z
$Performance_t$	-0.0258	(3.01)**			-0.0138	(1.24)
$TopQ_t$			-0.2237	(2.90)**		
$MiddleQ_t$			-0.1238	(1.97)**		
$OpenEnd_t$	0.0865	(0.87)	0.0879	(0.87)	-30.6450	(0.00)
$FamilySize_t$	0.0089	(4.09)**	0.0089	(4.09)**	-0.0071	(0.71)
$Foreign_t$	0.1293	(1.88)*	0.1314	(1.90)*	-0.0108	(0.03)
$Index_t$	0.2997	(2.32)**	0.2984	(2.31)**	-0.0282	(0.04)
$Turnover_t$	0.0003	(3.83)**	0.0003	(3.81)**	0.0005	(1.62)
$lnNAV_t$	0.0216	(1.17)	0.0212	(1.15)	-0.1803	(2.29)**
$DirectorsComp_t$	-17.6512	(0.63)	-17.5328	(0.63)	48.6961	(0.42)
$ExpenseReimb_t$	-7.2081	(1.15)	-7.2391	(1.15)	-49.6671	(2.50)**
$avgMSAdv_t$	-33.5344	(10.28)**	-33.4993	(10.27)**	-53.9780	(5.83)**
$avgHPAdv_t$	-0.03505	(2.01)**	-0.03469	(1.99)**	0.0257	(0.76)
Age_t	-0.01215	(0.77)	-0.0119	(0.75)	0.1740	(0.69)
$feeSolelyBasedOnNAV$	-0.5186	(2.66)**	-0.5181	(2.66)**	0.0794	(0.16)
$isConcave_t$	-0.1873	(3.25)**	-0.1867	(3.24)**	-0.0302	(0.12)
$ACA\&CA_t$	0.19074	(2.77)**	0.1906	(2.77)**	-0.2648	(0.54)
G_t	0.1518	(1.91)*	0.1514	(1.90)*	-0.4953	(1.04)
$G\&I_t$	0.2237	(2.47)**	0.2230	(2.45)**	-0.6173	(1.29)
TR_t	-0.0103	(0.10)	-0.0115	(0.11)	-0.3096	(0.56)
$cons$	-0.0387	(0.04)	-0.0697	(0.08)		
Year Fixed Effects	Yes		Yes		Yes	
R-sq	0.0325		0.0325		0.0548	

Table 10: Determinants of changes in performance. Each year funds are assigned to category-specific performance deciles ($Performance_t$) by comparing their returns to those of the other funds in the same category. $BottomQ_t$, $Middle_tQ$ and $TopQ_t$ are dummies indicating which performance grouping the fund belongs to: bottom two deciles, middle six deciles or top two deciles, respectively. SA_t is a dummy variable equal to 1 if one of the fund's advisors at time t is not among the fund's advisor in year $t+1$. For funds with concave contracts, AMR_t is the marginal rate that corresponds to the fund's current NAV. For single-rate contracts, AMR_t is the unique rate specified in the contract. $rateWentUp_t$ and $rateWentDown_t$ are dummy variables indicating if the rate increased or decreased compared to the previous year. $avgLMSAdv_t$ is the average market share in the previous year of the fund's current advisers. $avgLYPAdv_t$ is the average of the fund's currents advisors performance in the previous year. $lnNAVt$ is the log of the fund's NAV. $FamilySize_t$ is the number of portfolios in the fund's family. Age_t is the fund's age in years. $OpenEnd_t$ is an indicator variable equal to 1 for an open-end funds. $Index_t$ and $Foreign_t$ are dummy variables equal to 1 if the fund is an index fund or if it holds foreign securities, respectively. Panel A fixed-effects regression: Number of obs: 20982, F(22,13957)=68.13. Panel B fixed-effects regression: Number of obs: 19000, F(25,12470)=59.46. Panel C fixed-effects regression: Number of obs: 12490, F(25,7945)=33.59.

	PANEL A All contracts		PANEL B All contracts		PANEL C Single-rate contracts	
$Performance_t$	Coef.	t	Coef.	t	Coef.	t
$Performance_{t-1}$	-0.2056	(22.16)**	-0.2223	(22.55)**	-0.2223	(17.99)**
$SA_{t-1} * BottomQ_{t-1}$	0.0005	(0.00)	-0.0033	(0.02)	0.1170	(0.50)
$SA_{t-1} * MiddleQ_{t-1}$	0.2314	(1.94)*	0.2389	(1.92)*	0.3053	(1.95)*
$SA_{t-1} * TopQ_{t-1}$	-0.3659	(1.85)*	-0.4496	(2.19)**	-0.6182	(2.50)**
AMR_t			-0.1873	(0.38)	-1.2932	(1.94)*
$RateWentUp_t$			-1.1101	(7.61)**	0.1541	(0.53)
$RateWentDown_t$			0.5559	(4.80)**	0.2020	(1.05)
$avgLMSAdv_t$	-7.5306	(2.52)**	-12.4095	(2.45)**	-3.5591	(0.57)
$avgLYPAdv_t$	0.04205	(2.78)**	0.0566	(3.61)**	0.0643	(3.31)**
$LnNAV_{t-1}$	-1.2177	(24.84)**	-1.1630	(22.30)**	-1.0628	(16.73)**
$FamilySize_t$	0.0099	(1.07)	0.0061	(0.64)	0.0001	(0.01)
$OpenEnd_t$	2.8819	(1.99)**	2.8471	(1.97)**	5.9274	(2.93)**
$Foreign_t$	0.4280	(1.48)	0.5833	(1.87)*	0.8177	(2.06)**
$Index_t$	0.1097	(0.18)	-0.1494	(0.23)	-0.0329	(0.05)
Age_t	-0.0896	(3.70)**	-0.0930	(3.56)**	-0.0595	(1.83)*
$ACA\&CA_t$	-0.5407	(1.46)	-0.6096	(1.56)	-0.8854	(1.79)*
G_t	-0.8100	(2.14)**	-0.8681	(2.18)**	-0.7481	(1.53)
$G\&I_t$	-0.7553	(2.01)**	-0.9496	(2.38)**	-1.0037	(1.93)*
TR_t	-0.7261	(1.93)*	-0.7399	(1.84)*	-0.6036	(1.16)
$cons$	19.1695	(13.50)**	18.6362	(12.56)**	15.0823	(7.51)**
Year Fixed Effects	Yes		Yes		Yes	
R-squared	0.0970		0.1065		0.0956	

Table 11: Net inflows regression for all funds, with either concave or single rate contracts. Funds must be in sample at least three years to be included. $netInflows_t$ captures the rate of new inflows into the fund and is defined by $\frac{NAV_t}{NAV_{t-1}} - RawReturn_t$. $RawReturn_t$ is based on the change in the net asset value per share from year $t-1$ to t and includes dividends and distributions. Each year funds are assigned to category-specific performance deciles by comparing their returns to those of the other funds in the same category. The bottom performance grouping, $LOWPERF_t$ refers to the lowest two deciles of performance, defined as $min(Decile_t, 2)$. The middle six performance deciles are combined in one grouping, $MIDPERF_t$, defined as $min(6, Decile_t - LOWPERF_t)$ The top two deciles are combined in one group, $HIGHPERF_t$, defined as $Decile_t - (LOWPERF_t + MIDPERF_t)$. This is the procedure used in Sirri and Tufano (1998). The coefficients on these piecewise decompositions of performance represent the slope of the performance-inflows relationship on their range of sensitivity. $BottomQ_t$, $Middle_tQ$ and $TopQ_t$ are dummies indicating which performance grouping the fund belongs to: bottom two deciles, middle six deciles or top two deciles, respectively. SA_t is a dummy variable equal to 1 if one of the fund's advisors at time t is not among the fund's advisors in year $t+1$. For funds with concave contracts, AMR_t is the marginal rate that corresponds to the fund's current NAV. For single-rate contracts, AMR_t is the unique rate specified in the contract. $rateWentUp_t$ and $rateWentDown_t$ are dummy variables indicating if the rate increased or decreased compared to the previous year. $lnNAV_t$ is the log of the fund's NAV. $FamilySize_t$ is the number of portfolios in the fund's family. Age_t is the fund's age in years. $OpenEnd_t$ is an indicator variable equal to 1 for open-end funds. $Index_t$ and $Foreign_t$ are dummy variables equal to 1 if the fund is an index fund or if it holds foreign securities, respectively. Fixed-effects regression: F(26,12873)=14.28. Between-estimator: F(27,6515)=7.44. Random-effects GLS: Wald chi2(27)=171.05. Number of obs: 19442 in all specifications.

	Fixed-effects		Between estimator		Random effects GLS	
$netInflows_t$	Coef.	t	Coef.	t	Coef.	z
$LOWPERF_{t-1}$	0.0208	(0.14)	-0.0308	(0.27)	-0.0666	(0.59)
$MIDPERF_{t-1}$	0.0009	(0.04)	0.0474	(2.62)**	0.0298	(1.78)*
$HIGHPERF_{t-1}$	0.1498	(2.03)**	0.2425	(4.49)**	0.1567	(2.94)**
$LOWPERF_{t-1} * SA_{t-1}$	0.1026	(0.23)	0.1095	(0.34)	0.1377	(0.42)
$MIDPERF_{t-1} * SA_{t-1}$	0.0174	(0.25)	-0.0082	(0.16)	-0.0108	(0.21)
$HIGHPERF_{t-1} * SA_{t-1}$	0.3519	(1.51)	-0.5443	(2.96)**	-0.0568	(0.32)
SA_{t-1}	-0.3323	(0.44)	-0.1098	(0.20)	-0.2406	(0.42)
$lnNAV_{t-1}$	-1.3908	(18.10)**	-0.0935	(7.50)**	-0.1523	(9.09)**
AMR_t	-2.6889	(3.74)**	-0.0568	(0.61)	-0.1586	(1.27)
$rateWentUp_t$	0.2275	(1.05)	-0.4680	(3.28)**	-0.1193	(0.79)
$rateWentDown_t$	0.1221	(0.71)	0.4381	(3.61)**	0.4371	(3.65)**
$FamilySize_t$	0.0067	(0.48)	0.0004	(0.26)	-0.0035	(1.35)
$OpenEnd_t$	-0.6618	(0.31)	0.0563	(0.65)	0.0468	(0.48)
$Foreign_t$	0.1675	(0.36)	-0.0059	(0.10)	-0.0390	(0.48)
$Index_t$	0.4155	(0.47)	0.0889	(0.77)	0.0475	(0.30)
Age_t	0.0743	(1.94)*	-0.0120	(0.74)	-0.0309	(1.70)
$ACA\&CA_t$	0.3401	(0.59)	0.2544	(4.11)**	0.3300	(4.06)**
G_t	0.3566	(0.61)	0.2550	(3.61)**	0.3031	(3.25)**
$G\&I_t$	0.2617	(0.45)	0.1597	(2.10)**	0.1824	(1.84)*
TR_t	0.0342	(0.06)	0.0860	(1.05)	0.1234	(1.14)
$cons$	17.7443	(8.12)**	0.9229	(3.23)**	2.0583	(6.01)**
Year Fixed Effects	Yes		Yes		Yes	
R-square	0.0280		0.0299		0.0087	